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ACCURACY OF PERCEPTION OF VERTICALITY, AND THE FACTORS THAT INFLUENCE IT

A PRELIMINARY SURVEY

1. If an attempt is made to place a movable line in a vertical position, it will be found that a peculiar difficulty attaches to the task. The most delicate correction of a very nearly perfect position almost inevitably throws the line too far, and a vacillation results which is difficult to terminate. This vacillation is an effect not merely of an uncertainty due to the limitations of our ability to identify an actual position of the line with our ideal of verticality, —*i. e.*, to the degree of acuteness of discriminative sensitivity for positions nearly vertical,—but quite as much to an apparent restlessness and constant change of inclination of the line itself. The line seems alive, and baffles one's best endeavors to hold it still and subject it to a steady scrutiny. A momentary satisfaction may be obtained and a record made of the degree of error; but this error will represent not merely the sensitivity for the vertical position, but the operation of a considerable complex of other factors also. This present paper aims to give a cursory survey of the errors recorded under a variety of conditions, and of the attempt to unravel the various factors which exert an influence upon the way in which the line is seen inclined.

2. For the purpose of this investigation a line was used—usually a white thread against a black background—fixed at its lower extremity and so arranged that its upper extremity could be pulled to right and left by means of cords in the hands of the observer. The latter endeavored to place the line in a position which should seem to him vertical, and the degree of angular deviation from the true vertical was recorded. It makes much difference whether the eye is free to roam about within the field, glancing up and down the line, or is fixated on one of its points; and whether, in the latter case, it is the top, middle or bottom part that is fixated. For the better comparison of different cases, however, and analysis of the influ-

encing factors, a uniform method of examining the line was adopted, namely, the fixation of its bottom point, or, in case of indirect vision, of some point on the same horizontal level.

3. *Difference between Right Eye, Left Eye, and Both Eyes.*—The right eye tends to judge a vertical line as being slightly inclined upward to the left, when its bottom point is fixated; the left eye, as slightly inclined to the right. Either eye may, however, see it inclined in either direction, but these are the prevalent tendencies, and even when for each it inclines apparently in the same direction, for the left eye it is almost uniformly more inclined to the right (or less to the left) than for the right eye. The average position, for different persons or for the same person at different times, has varied between 0.5° R. and 1.5° L. for the right eye, and between 1.0° R. and 0.9° L. for the left eye. The difference in position for the two eyes separately has varied between 0.1° and 1.25°. These are average positions, determined sometimes by a large number of single observations. The extreme positions which under any circumstances have seemed vertical have been 10.6° R. and 4.2° L.

When both eyes are used the tendencies vary. The averages have ranged between 0.3° R. and 0.3° L. In the case of seven persons the position for the two eyes together coincided very nearly with the position for the right eye alone; in the case of eight persons, with that for the left eye alone; in four cases it was more nearly vertical than for either eye singly, each seeing it inclined in the same direction; and in one case it was more extreme than for either eye alone. In some of these cases the number of tests was insufficient to establish the certainty of the tendency noted. The thoroughly tested cases, however, are enough to show that there is a preponderant tendency for a person to be either right-eyed or left-eyed, when both eyes are used. Curiously enough, no case was met with of the type that one might naturally expect to occur, where for both eyes together the line assumes a position midway between the positions for either eye singly.

4. *Indirect Vision.*—When a point is fixated in the field to one side of the line and opposite its middle point, the vertical line appears to curve with its concave side toward the fixated point. When the fixated point is opposite the bottom of the line, the line as a whole appears to incline upward to the left if fixation is on the left side, to the right if fixation is toward the right. In one particular series, embracing 1,500 tests, the apparent inclination averaged, for fixation to the right, 1.0° more to the right than when the line itself was fixated, and for fixation to the left 0.5° more to the left. In general, the average values have varied between 0.1° and 1.5° for fixation right, and between 0.5° and 1.2° for fixation left, further than in

fixation of the line. Fixation to the right almost uniformly gave the larger effect, in some cases double that of the other. The maximum effect was found to occur in the case of one person at an angular distance of about one half degree from the line. As the fixation distance increased the effect diminished steadily and finally reversed on some occasions, though in extreme positions there sometimes occurred a secondary increase. A possible explanation of this behavior is discussed later.

5. *Effect of Inclination and Rotation of the Head.*—If the head is tipped sidewise toward the shoulder, it has an effect upon the apparent inclination of the line. Inclination of the head makes the line appear inclined in the same direction as the head. The amount of effect has varied from a very slight value up to about 1.5°. Inclination of the head backward and forward and rotation about a vertical axis also seem to exert some influence, but its nature and degree are far from uniform.

6. *Effect of Effort.*—It is possible to change the apparent inclination of the line by exerting a voluntary effort. If one endeavors to force it to appear inclined to right or left he may succeed, and the line then requires a larger correction to make it appear vertical. The degree of this effect has varied in these tests all the way from zero to 3.0°. In the case of one subject, the efforts to the left are from 50 to 100 per cent. stronger in effect than those to the right. The nature of the effort exerted is variable and difficult to analyze. It usually consists of a combination of factors, among which may enter: a mental representation of the line in the desired inclination; a mental representation as of seizing the line with the eye and twisting it, or of seizing some point of it and pulling it to one side; actual fixation to one side; inclination of head and pressing it against the head-rest, as if pushing the line with it; various strains in muscles of head, neck and eyes. That the effect is not identical with that of side-fixation and of head-inclination, already mentioned, is proved by the fact that these may be made in the opposite direction without destroying the efficiency of the effort.

Still other conditions produce definite measurable effects upon the apparent inclination of the line. Some of them are of large importance, as, for instance, the direction in which the corrective movements of the line are made (after-images of movement), the degree of illumination and the number and nature of distinguishable objects in the field. Consideration of these can be postponed a little with advantage.

7. *Analysis of Factors Influencing the Perception of the Line's Inclination.*—It is evident that these are numerous and complex, but it is not impossible that they may reduce to a few relatively simple

ones. It will be well to enumerate them rather crudely at first, and then attempt a reduction to the more important.

(*a*) *True Limitations of the Discriminative Sensitivity for the Vertical Position.*—This is evidently much finer than is shown by the amount of error in attempting to establish the vertical position, on account of the numerous other factors that influence this endeavor. It is impossible to isolate the one from the others and to determine its exact value. A fairly accurate idea may be gained, however, of the size of the variable error by an examination of those cases where, after acquaintance with the important influences has been secured, a special endeavor is made to hold them unchanging through a long series of tests. Even so, irregularities creep in at intervals; but steady results have been attained many times that show a very delicate ability to discriminate between different positions. One series shows five successive positions exactly the same. A series of 10 judgments contains 9 that are within 0.1° of one another; one of 14 contains 11. In one series of 10, all are contained within extreme limits of 0.2°. In a series of 15 the average error is 0.08°, and the extremes are within 0.18° of the average value. Many other series occurred where the delicacy of recognition of a definite position was but slightly less than that shown by these examples.

(*b*) *Purely Mental* (*or Central*) *Factors.*—Every sensory complex must be joined to a complex of central apperceptive elements before it can acquire any spatial significance at all. Preperception, which we found acting consciously sometimes, at least: in the case of effort, and which doubtless is present unconsciously in some other cases, is also of importance. But both apperceptive and preperceptive structures are built up out of closely associated sensory material gained in previous experience, and may reduce, therefore, so far as their visual elements are concerned, to sensory factors yet to be mentioned. Moreover, it is conceivable that they may be unable to operate without involving the actual presence of certain peripheral sensory conditions.

(*c*) *Diffusion Images and Retinal Fatigue.*—Only the portion of the line in the immediate neighborhood of the point actually fixated will cast a clearly defined image on the retina, because this portion only coincides with the horopter. The rest of it will be more or less fan-shaped. Retinal fatigue may lead to an over-emphasis of some parts of the fan-shaped image, and produce, therefore, for the moment an actually inclined image of the line on the retina. Experience shows, however, that this factor is much less influential than most of those yet to be mentioned.

(*d*) *Inclination of the Image on the Retina.*—This by itself means nothing spatially until apperceptively interpreted. When a natural apperceptive interpretation is once established, the relative position of the retinal elements affected is of importance. We have just seen one condition which influences the inclination of the retinal image. Another case occurs when the head is inclined to one side. In the latter case, however, when the head-inclination is conscious we are accustomed to allow for its occurrence and to make a more or less accurate correction for it. An approximately vertical line seems still vertical if the head is inclined toward the shoulder, or is upside down. If the inclination of the head were wholly unallowed for, it would result in an interpretation of the line as inclined in the opposite direction. That the direction of apparent line-inclination and of head-inclination when the latter is conscious is usually the same, seems to show a general tendency to over-allowance, or the operation of some other factor.

Still another case of changed inclination of the retinal image occurs when the line is viewed indirectly, with actual fixation on a point to one side of it. The effect in this case is usually explained as reducible to a simple matter of perspective projection. An after-image of a line coinciding with the vertical meridian of the retina will, if projected to the right and upward (corresponding to our case of fixation to the left of the base), seem inclined to the right upward, following Helmholtz's lines of direction. A truly vertical line in that position will, therefore, seem inclined to the left, in case a line whose image falls on the ordinary vertical meridian of the retina is regarded as vertical. This does not occur if the eyes are themselves turned to the peripheral position, for the effect of perspective is allowed for and interpreted, so that the true vertical still appears vertical. But in indirect vision, it seems, no such allowance is made, and that line is regarded as vertical whose inclination is the same as would be that of a vertical after-image if projected to that part of the field. Whether this accepted explanation is fully adequate is a matter to which further investigation should be devoted.

(*e*) *Constant Unconscious Movements of the Eye about the Fixation Point of Attention.*—Attention may be held concentrated upon a given point of the line, accompanied by the feeling that the fixation of the eye is held steadily upon the same point. Yet the eye will nevertheless be making constant slight movements in all directions about the supposed fixation point. That this dissociation of the fixation point of the eye from the fixation point of attention is constant and normal may be shown by three methods at least. While the subject is conscious of no deviation of his attention (or

of his eye) from the given spot, the constant eye movements may be detected (1) by a direct record of slight eye movements, by means of instruments attached to it; (2) by examination of the eyeball through a microscope; (3) by the projection of after-images. Of all these methods use has been made during this research. This normal failure of the eye direction to coincide with the direction of attention serves a useful purpose, in that constantly fresh retinal surfaces are presented for the unchanging stimulus, and the effects of retinal fatigue are thus prevented or delayed. But it is evident that in this way during the course of the examination of a line the effects of side-fixation are being constantly introduced and are constantly changing. From this fact, to a large extent at least, results the puzzling restlessness or aliveness of the line, of which mention was made at the outset.

(*f*) *Muscular Tension Apart from Actual Movement.*—This is a factor which, so far as the writer is aware, has not been considered in previous expositions of the influences that determine our spatial perceptions. Yet it would seem to exist really and to be of large importance. The evidence for it is partly introspective, partly by exclusion of other factors as a possible explanation of the results when muscular strains are present. It may be briefly summarized as follows:

(1) The line often appears inclined in one direction when fixation is on the opposite side (as shown by microscopic or after-image examination), when head-inclination is in the direction opposed to that which would produce such line-inclination (as shown by delicate records of head position), when there is no conscious preperception and no effort. Changing muscular tensions within the eye muscles could account for this effect; it is not easy to see what else could explain it.

(2) Muscular tension can be shown to be efficacious when a voluntary effort is made to cause the line to assume a given apparent inclination. The effect is much larger than could be accounted for by any other factors known—preperception unattended by muscular effort, side-fixation or head-inclination,—and may be made to work strongly in a direction opposed to and overcoming their influences.

(3) Introspection clearly attributes the efficiency of the endeavor just spoken of to the muscular efforts made.

(4) Although head and neck muscles usually cooperate with eye muscles in case a strong effort is made, yet the former may be excluded and the eye muscles alone shown to be capable of producing the results. We have cases of the apparently exclusive influence of tension in eye muscles (i.) when a voluntary effort is deliberately confined to them; (ii.) in the influence of surrounding objects in the

visual field, which produce tensions in eye muscles tending to turn the gaze upon them, and whose number and relation to interest and attention are of large importance in helping to determine the apparent inclination of the line; (iii.) when resistance to eye movements is introduced by attaching recording instruments directly to the eyeball.

Of course, no muscular tension has spatial significance unless it enters into a fitting sensory and ideational complex which permits it to be so apperceived; and a given tension may or may not be spatially interpreted, according as it is incorporated into one or another apperceiving group. If an object, ideational or external, engages attention and tends to cause an eye movement, and if steady fixation is maintained and the solicitation to movement not yielded to, it is evident that the tension induced in the muscles directly solicited to action is balanced by a corresponding tension in the opposing muscles. The tensions directly solicited, or those most clearly felt, enter into a spatially interpreted complex, as a consciousness of an object or field of objects to one side, or of a line under consideration having a certain direction, etc.; the opposing tensions enter into a different apperceptive complex and appear in consciousness, if at all, as effort of resistance. The same two tensions, however, may receive each the other interpretation, if attention is so transferred as to change their rôles with respect to solicitation and resistance. Thus either or both tensions may receive a spatial interpretation, or an effort interpretation, or may be directly felt as strain in eye muscles, according to the particular apperceptive systems into which, because of the interests of the moment and the direction of attention, they are taken up.

8. *The Most Fundamental Factors* of those above enumerated, to which or to influences on which almost all the others may be reduced, would seem to be: (*a*) the actual inclination of the image on the retina, together with those central associates which give it a spatial meaning. This is influenced by the actual inclination of the line, by the position of its image on central or peripheral portions of the retina, by the direction in which the eye is turned, by the slight unconscious movements which the eye is constantly making, by movements of the head as a whole, by over-emphasis of one or another portion of the diffusion image of non-fixated portions of the line, etc.

(*b*) Tensions in eye muscles and head muscles. Among the influences that induce these may be mentioned: deviations of attention from the actual fixation point; preperception; voluntary effort; a tendency to the persistence of previous tensions; movements of the line; attraction or repulsion of distinguishable objects, etc. There seems to be some evidence for the existence of rhythmical tendencies

to variation in tension. It is probable also that certain combinations of lines, when attended to, arouse tendencies to fixation in definite positions, or to tensions toward those positions.

9. *Reduction of Some Complex Conditions to the Simple Factors.*—(*a*) Preperception, expectant attention, the arousal of a mental representation of the line as having a particular inclination, probably never produces any actual effect upon its appearance unless accompanied by actual muscular effort. (*b*) The after-effects of movement of the line are probably due to tendencies of the eye to stop short of the final position of the line, or to go on beyond it; and to the persistence of particular changes in muscular tension. (*c*) The effects of fatigue are due to changes in the retinal image, and to a diminishing control over eye and head movements and muscular tensions. (*d*) Intensity of illumination acts through increasing or decreasing the number and intensity of distinguishable objects in the field. These in turn produce an influence on the apparent inclination of the line, and on other spatial structures, through affecting the muscular tensions; and similarly they ' steady ' the whole muscular system, and increase the delicacy and strength of its control. In the dark, or in high places where the eye has little to cling to, control of the whole muscular system and often of the mental steadiness and clearness is weakened. A field of distinguishable objects sets up innumerable innervations in the eye muscles, holding them in a state of constant tension. This has at least two important consequences. It reflexly affects the innervation of the whole muscular system, giving its action greater control and steadiness. Secondly, it increases the quickness, delicacy and control of the eye's own reactions; and the presence of particular tensions, or prevalence of general tension in particular directions, in conjunction with the particular sensory and apperceptive complexes with which their sensory effects unite, determines particular spatial perceptions. The effect produced by distinguishable objects on apparent inclination of the line varies according to circumstances. If the peripherally situated objects are not attended to, their greater number, or their greater intensity, or perhaps also their greater natural interest, in a certain direction, produces the opposite effect to side-fixation in that direction. The power of an object or of a group of objects to produce this effect is greatly strengthened in case they force themselves on attention. In the latter case, however, if one distinctly does not wish to yield to their attraction, an effort of resistance may be made which is liable to be over-great, and thus an effect of practical repulsion results and the effect on the line under observation is reversed. (*e*) An interesting complexity of conditions revealed itself in a series of tests on the effect of fixation at different distances away from

the line, to right and left. There was an increase in effect up to a maximum a short distance away from the line; then a steady decrease through a considerable distance, proceeding so far as to reverse the illusion; and often a final increase again. In these tests the head was fixed in position and the eyes alone turned. The first phase seems to reveal the pure effect of side-fixation; this is opposed during the second phase by an increasing nearness and visibility of distinguishable objects in the side field, whose effect finally proves stronger than that of side-fixation; and in the extreme positions strong muscular strains are present and clearly felt, and these come to the support of side-fixation. The problem as to the effect of turning head and eyes together and allowing no distinguishable objects in the field is now under investigation.

10. *Practical Applications.*—It is obvious that our spatial perceptions are influenced to a large degree not only by the actual conformation of the image on the retina, and by the movements actually executed by the eye in following lines and contours, but also by the tensions existing in eye muscles apart from those involved in the actual execution of movements. We have seen how these factors affect a particular spatial perception, that of vertical direction. All the other fundamental spatial elements are similarly influenced. Not only is the vertical direction affected, but also all other directions, whether in the plane perpendicular to the lines of regard, or in the third dimension. The impression of spatial extent is determined also by the same factors. It is well known that esthetic judgments are influenced by the natural points of orientation and the natural methods of exploitation. The same is true of spatial judgments. The eye has a tendency to come to rest most easily in certain positions, determined by the combination of lines within the field, and when not at rest in that position, there exists a muscular tension toward it. Again, the eye has a tendency to follow certain paths most easily, in the exploitation of a figure. The spatial consequences of these facts can be observed most simply in the case of the well-known geometrical-optical illusions. The particular form assumed by the figures with reversible perspective, for example, is determined fully only when account is taken not only of actual fixation-points and of actually executed movements in definite directions, but also of the tensions induced in definite directions, either on the surface of the figure or toward points nearer or farther away. The details of these facts we are now investigating. In the case of the Zöllner illusion, the eye in following the parallels tends to slide unconsciously down the transverse lines a little way and to come back always to the line with an effort. Consequently the line seems further and further away, in a direction opposed to that in which the

unconscious deviations from a straight path take place. The eye does not move with equal ease in both of two opposite directions. Consequently the unconscious deviation will be greater for transversals going in one direction than for the other set, and the recently discovered unequal distortion of the different parallels will be explained. With the eye at rest, the conformation of lines is such as to establish for it certain points of easiest fixation, and their assumption, or the existence of tensions toward them, gives the distorting effect of side-fixations, which associates itself with the experiences gained during movement and supports the illusion. In the case of the Müller-Lyer illusion, the easiest fixation-point for the eye, when attention is on the end of the line, lies within the angle. If the eye actually rests on any other position of the field when the figure is under examination, there exists a muscular tension toward the point of easiest fixation. Accordingly, whether the figure is surveyed with the eye at rest, or with it sweeping over the field in any desired irregular manner, or with it following the line carefully from one point of easiest fixation to the other while attention goes from actual end to actual end, the perceived length is determined by the amount of actual movement involved in the latter case; and thus the apparent difference in length of the two parts of the figure is explained. Angles of different degrees and of different lengths of sides, and end-figures other than angles, involve different positions of the point of easiest fixation, and hence differ in the degree of illusion produced.

The most important result of this whole study is the establishment of the fact that the internal tensions of the muscles of the eyes (and of other bodily parts), apart from those involved in the execution of actual movements, are of the greatest consequence in determining the details of our spatial perceptions.

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RECENT CONTRIBUTIONS TO THE LITERATURE OF SCHOLASTICISM.

GENERAL interest in that phase of philosophic thought which is known as scholasticism may be said to date from the publication of Cousin's 'Ouvrages inédits d'Abélard' (Paris, 1836). Since that time much, indeed, has been done towards the historical presentation of scholasticism; much, however, still remains to be done, especially in the matter of completing our fund of original literature referring to scholastic philosophy. It is the purpose of

the present paper to indicate briefly the more important lines of historical investigation in this department of the history of philosophy, and to mention some of the most recent contributions in each line.

Those who are competent to judge tell us that there still exists in the libraries of France, Italy, Germany and England a vast amount of medieval philosophical literature in manuscript, and all who are interested in scholasticism realize that the publication of material of this kind is the form of neo-scholastic activity which, before all others, recommends itself to the modern student. The difficulty of deciphering, collating and annotating medieval texts is well known; and if, on account of this difficulty, the output has been comparatively meager, we may console ourselves with the reflection that the work is being carefully done. The group of scholars who, with Dr. Clemens Baeumker, of Strassburg, as editor-in-chief, began in 1891 to edit the unpublished treatises of the medieval philosophers in the *Beiträge zur Geschichte der Philosophie des Mittelalters* (Münster, 1891, ff.) have given us texts and critical studies which can not be too highly praised. Their latest publications are: Espenberger, 'Die Philosophie des Petrus Lombardus und ihre Stellung im zwölften Jahrhundert' (Bd. III., Heft V., 1901); Willner, 'Des Adelard von Bath Traktat De Eodem et Diverso'; Baur, 'Dominicus Gundissalinus, De Divisione Philosophiæ'; Engelkemper, 'Die religionsphilosophische Lehre Saadja Gaons über die hl. Schrift'; Schneider, 'Die Psychologie Alberts des Grossens' (these four titles constitute Band IV., 1903). This collection, it is hoped, will realize the plan contemplated by Barach, who in 1876 began the publication of 'Bibliotheca Philosophorum Mediæ Ætatis.' Barach's project was abandoned after the publication of three short treatises (Innsbruck, 1876–8). Next in importance to Baeumker's *Beiträge* is the collection of Belgian philosophers edited by de Wulf, of the University of Louvain, under the title 'Philosophes belges'; two volumes have already appeared, 'Le traité des formes de Gilles de Lessines' (Louvain, 1901) and 'Les quatre premiers Quodlibet de Godefroid de Fontaines' (Louvain, 1903). What de Wulf is accomplishing for the Belgian scholastics is being done for the medieval philosophers of Spain by Pelayo, who has edited several treatises of the early schoolmen in his 'Heterodoxes Españoles' (Madrid, 1880 ff.). Under the head of recent publication of original texts mention must be made of the edition of the 'Impossibilia' of Siger of Brabant, by Père Mandonnet, of the University of Freiburg in Switzerland.

After the publication of manuscript sources the most important work in the department of scholastic philosophy is the republication in critical editions of the 'Opera Omnia' of the schoolmen. This has

been done in the case of St. Bonaventure, St. Thomas, Albertus Magnus, Duns Scotus, Denis the Carthusian; and a new edition of the works of Roger Bacon is promised for the near future. Unfortunately, the older editions, unattractive as they are to the eye accustomed to modern typographical finish, and uncritical as they sometimes are in the matter of 'attribution,' are, in some instances, superior in textual accuracy to the more attractive modern editions.

The reconstruction of the educational environment in which the scholastics worked is by no means the least important part of the task of the historian of scholasticism. To this department valuable material has been furnished in recent years. First in importance is Denifle's 'Chartularium Universitatis Parisiensis' (Paris, 1889 ff.), which renders accessible the original material for the history of the University of Paris—the center of scholastic philosophy and theology during the golden age of the scholastic movement. Denifle has also furnished a more general picture of medieval university life in 'Die Entstehung der Universitäten des Mittelalters bis 1400' (Berlin, 1885). On a smaller scale Türnau's 'Rhabanus Maurus' (Munich, 1900), Clerval's 'Ecoles de Chartres' (Chartres, 1895) and Mignon's 'Origines de la scolastique' (Paris, 1895) present a picture of the educational conditions which determined the development of scholasticism in the various centers of medieval culture.

Finally, critical work of a high order has recently been done in the publication and discussion of biographical material relating to the philosophers of the Middle Ages. It has long been recognized that the materials in use, consisting of chronicles and 'lives' often carelessly compiled, were in need of a thorough critical revision; it was necessary to reconstruct dates, to discuss the question of the reliableness of the chronicler, to control his exaggerations and his inaccuracies, and, generally, to apply modern methods of historical research to the vast amount of material available. Besides, new and valuable material has been discovered. Thus, to mention merely the most important, the 'Analecta Bollandiana' published by the Jesuits at Brussels has furnished new data for the life of Albertus Magnus, the Franciscan editors of the Quaracchi edition of the works of St. Bonaventure have rewritten the life of the Seraphic Doctor from new materials, the coeditors of the *Archiv für Literatur- und Kirchengeschichte des Mittelalters* (Freiburg im B., 1885 ff.), Fathers Denifle and Ehrle, archivists of the Vatican, have published important materials for the biographies of Henry of Ghent, Peter John Olivi, Master Eckhart, etc.

The foregoing list will, it is hoped, give the reader some conception of the amount of original work that is being done in the department of scholastic philosophy. The attention which this work

receives is evident from the recent increase in periodical literature of the second order, namely, discussions, appreciations, résumés, which are to be found in the current philosophical magazines, especially in those which, like the *Revue Thomiste* and the *Néo-scolastique,* are specially devoted to the study of the philosophy of the schools. In a subsequent article an account will be given of the most important of these recent studies.

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NOTE ON THE IDEA OF A 'MORAL SENSE' IN BRITISH THOUGHT PRIOR TO SHAFTESBURY[1]

THE ethical problems of the seventeenth century were stated mainly in terms of rights and duties. Natural rights and laws of nature were familiar to the readers of Hobbes, Cumberland, and Locke. The moralists of the eighteenth century, for the most part, consider rather the instincts and sentiments. The first expression of the new attitude is usually attributed to Shaftesbury. But while Shaftesbury and his more systematic follower, Hutcheson, deserve credit for the extended formulation and development of the doctrines of moral sense and benevolent instincts, we find distinct statements of the essence of the doctrine and even of the technical term in at least two divines, Tillotson and Barrow. The transition by which an old concept is made to do duty for a new idea has an interesting illustration in Tillotson's definition of the term 'Light of Nature.' This term with Descartes had borne the meaning of discernment or intellectual recognition. With Cumberland and Locke reason was a corresponding principle. But Tillotson, in sermon 101, defined 'Light of Nature' as 'a natural instinct, by which I mean a secret impression upon the minds of men, whereby they are naturally carried to approve some things as good and fit, and to dislike other things as having a native evil and deformity in them.' Here the 'light' is affirmed to be an 'instinct,' and if the phrase 'approve as good' may seem to imply a judgment which has a rational element, the term 'dislike' is purely a term of feeling; while the word 'deformity' naturally suggests the æsthetic qualities which play so large a part later. The transfer of the moral categories to the realm of feeling is thus well on its way.

Much more explicit statements are found in Barrow, whose sermons were published in 1685; and these statements take on

[1] Read at the meeting of the American Philosophical Association in Princeton, December 30, 1903.

additional interest from the fact that Shaftesbury was acquainted with this author and speaks of him with esteem in his 'Letters of a Noble Lord to a Young Man at the University.' The important points in Shaftesbury's account of human nature are: (1) His championship of a social 'herding' instinct; (2) his claim that happiness depends upon having the generous affections strong, and that to have the private affections too strong is to be miserable; (3) the immediacy of the approval or disapproval which we pass on moral acts. This immediate approval is made analogous to the æsthetic feeling, or sometimes to the sensuous reactions of smell and taste. All these doctrines are explicitly stated by Barrow. The first appears in the following from sermon 62: "Nature implanted in our constitution a love for society and aversion from solitude . . . a generosity innate to serve the public and promote the benefit of society." One of the two aspects of the second doctrine is contained in this sentence from the same sermon: "Even a true regard to our own private good will engage us not inordinately to pursue self-interest."

The third doctrine, that of immediate approval by a 'sense,' is stated in the following, and from the fact that the passage is found in at least two sermons (26 and 28), the doctrine was evidently a favorite with its author: "The practice of benignity, of courtesy, of clemency, at first sight, without any discursive reflection, doth obtain approbation and applause from us; being no less grateful and amiable to the mind than beauty to our eyes, harmony to our ears, fragrance to our smell and sweetness to our palate; and to the same mental sense, malignity, cruelty, harshness, all kinds of uncharitable dealing, are very disgustful and loathsome."

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DISCUSSION

PROFESSOR PIERCE ON SPACE PERCEPTION

I CAN not understand Professor Pierce's allusion to what he supposes has been established since 1897, unless it means to refer to the discussion between Professor Stratton and myself that year on the problem of ' upright vision ' in the *Psychological Review*. But if he assumes that my article meant to deny that it is a problem of vision he has wholly mistaken it. It was my main purpose to show in that paper that whatever tactual 'uprightness' may exist, there is also a visual 'uprightness' which is convertible with the inversion

of the relation between the retinal image and the object, according to the laws of optics. If he thinks that Professor Stratton made out his point in the case I can only say that he has read my paper in vain. No doubt the conception of 'upright' as ordinarily used is a synthesis of visual and tactual experiences involving association, but each sense has its own problem, and if we do not wish to use the term 'upright' to denominate that of vision, the fact does not eliminate the inversion of the relation between the retinal image and the perceived object, as conceived by the laws of optics. Hence I must consider the problem as one of vision, whatever may be said about touch.

As to the rest of the case, my whole argument conducted in the paper on binocular vision in the memorial number of the *American Journal of Psychology* was an *ad hominem* one. I was not concerned with any questions of the retinal image as a fact, nor with any special interpretation of Hume's 'impressions,' nor with any cortical action. I do not care what these may be. I was dealing with the usual assumptions about these and their consequences. So far as I know, they may be wholly false. In fact, I profess entire ignorance as to what goes on in the cortex and in the retina. Further, I shall say that I do not believe that any physiologist or psychologist knows anything about what goes on in the cortex. We have plenty of theories about it based upon analogies with sense experience, which are just as good and just as bad as all talk about the retinal image. You can not get any belief in the existence of the cortex without assuming the transcendency of perception. If you mean to be sceptical about objective perception you must not talk about cortical facts of any kind unless they are treated as hypothetical. For all that we know directly, the cortex has no spacial qualities at all, either bidimensional or tridimensional. The free speculations on it and its functions, in so far as immediate knowledge is concerned, are only so much theory which we tolerate because we do not wish to substitute idealistic speculation for physiology. But granted that we know all about the cortex as a spacial object, how do its processes explain space perception? What are its processes and how are we to conceive them? We talk very glibly about them in our physiology and psychology, and are taken to have knowledge of them, but what else are our conceptions but the most abstract and speculative? When dealing with epistemological questions, I for one shall not allow myself to be fooled by all this speculation about cortical phenomena. They may be anything you please. I do not care what they are. I am and was concerned only with the question of consistency and clearness in the Berkeleian conception of vision. If it were shown by psychology and physiology that we

have had false notions of the retinal image and of Hume's 'impression,' my *ad hominem* argument with Berkeley would not apply, but I should be left with my conclusion quite as intact as before, since there would be no basis for that school at all.

As to Hume's 'impression' and 'sense experience,' I can discuss them when we are clearly told what they are. I have never yet seen any more definite or clear idea of these than I have found in the usual hotch-potch of philosophic abracadabra. I would like to know what they are. I merely observe that all recent philosophy talks about 'experience' in a way that sometimes implies its inclusion of everything, and sometimes its Lockeian limitations, which are generally negatively defined. The former conception makes the term useless in philosophy and the latter leaves us where Locke was. I do not pretend to discuss the epistemological problem in any *ad rem* fashion from either point of view. Hence I try neither to transcend 'experience' nor to remain within it, until I know what it is. My discussion in the paper reviewed by Professor Pierce had no reference to the nature of 'impressions,' but to certain conceptions of them, and these not my own. I can touch upon the question whether perception makes additions to sense experience—actual conscious sense experience—only when I have found out what this is. I have never yet seen any intelligible statement of what it is. All the transcendency that I have in mind is that which has to be admitted when we talk about cortical existence and processes, and was designed to justify any talk about them at all.

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REVIEWS AND ABSTRACTS OF LITERATURE

Studies in Logical Theory. JOHN DEWEY. The Decennial Publications of the University of Chicago. 2d Series, Vol. XI. Chicago, The University of Chicago Press. 1903. Pp. xiii + 388.

This book is first of all an account of the nature of knowledge, but it soon becomes a theory of experience and even of reality. Taken as a whole its thesis is, in the words of Professor Dewey (preface, x), that "knowledge . . . must be . . . reconstructive or transformatory (of experience); since Reality must be defined in terms of experience, judgment appears . . . as the medium through which the consciously effected evolution of Reality goes on." The first ten chapters are devoted mainly to the theory of knowledge and experience, and the last chapter mainly to the philosophic aspects of the theory. As the book has attracted much attention in America its contents will be summarized very briefly here, that I may pass at once to a criticism of its fundamental positions.

In the first four chapters Professor Dewey outlines the logical system. In Chapter V. Dr. Helen B. Thompson criticises Bosanquet's theory of judgment upon this basis; in Chapter VI. Dr. S. F. McLennan describes three stages of judgment; in Chapter VII. Dr. M. L. Ashley shows that the predicate of judgment is an hypothesis. Chapter VIII., by Dr. W. C. Gore, treats of 'Image and Idea in Logic.' Chapter IX., by Dr. W. A. Heidel, on the 'Logic of the Pre-Socratic Philosophy,' has a mainly historical interest. Chapter X., by Dr. H. W. Stuart, on 'Valuation as a Logical Process,' shows that there can be no objects that have not ethical or economic value; and Dr. A. W. Moore in Chapter XI., under the title 'Some Logical Aspects of Purpose,' presents, in criticism of Professor Royce's absolutism, the philosophic thesis that reality is essentially dynamic, not static.

The general position may be briefly outlined as follows: Judgment (which is the essence of knowledge) can be understood only if we know the conditions of its origin. Now we think and judge only when our habitual reflexes do not meet our needs. We have to seek some new course of action; the proposing of this to ourselves is entertaining an idea or plan of action, an hypothesis, which is crystallized in the judgment 'reality is such as to permit this action.' If the plan turns out to be useful for our need, it is correct—the judgment is true; if not, the judgment is erroneous. The real-ideal distinction is that between stimulus of environment and plan of action or tentative response. Both real and ideal are equally experiences of the individual man. Knowledge is only the means of gaining control over our environment or bettering our condition, is wholly teleological. Any dualistic theory of reality and idea is unable to find a criterion of truth and error; the present monistic view avoids this difficulty. In discussing this position I shall call it by the widely accepted term 'pragmatism.'

First of all one must beware of interpreting this view too narrowly. When we are told that reality changes always, we should not jump to the conclusion that no sort of permanence is allowed to anything in our experience. The pragmatical argument is after all not very far from Kant's. There must be knowledge, said Kant, so there must be certain forms of it, and a permanent self to remember; and a pragmatist might say: I need knowledge, therefore I find it most useful to erect certain standards or pigeon-holes for convenient reference, to classify my materials; and these I had best keep practically constant. Perhaps there are no pure pragmatists; perhaps they simply mean to insist on one important aspect of experience among other and equally important aspects.

But the question I wish to raise is, have we here a *philosophic* account of experience, that is, one which applies universally to all the facts? Have these writers not selected a certain aspect of experience and erected that into a metaphysical principle, neglecting other aspects quite as clearly present, and thus hypostasizing what is only an abstraction? (And note that the pragmatist, in Hegelian fashion, regards abstraction as falsification.) In short, have they been truly empirical, as they profess to be

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when they take 'evolution' (save the mark!) as a war-cry? I think they have not, that they have been false to their own initial method, and have neglected some very commonplace facts.

We are told by Professor Dewey that the only way to understand the nature of any process is to see how it arose, what called it forth. This rule is, I believe, often found useful in biology, and perhaps in psychology; but have we any right to generalize from these? Other sciences use a different method. I see a colorless liquid in a glass before me that looks like water. To test this I take it to a laboratory, pass an electric current through it, and get two gases with volumes two and one, which by recognized tests I prove to be hydrogen and oxygen. The method here is analysis, bringing the thing into relation with other things, to see what effects arise. We do not care to know how it is made, but rather what it becomes. Indeed, in most cases we judge the nature of a thing by its effects rather than by the way it originated. Why not generalize that method as well as the other? The fact is, pragmatism borrows this genetic method from just one of the sciences (perhaps because it forms the most useful basis for pragmatism) and straightway declares it the only genuine philosophic method. But, you say, in the other sciences we are dealing with inanimate, unconscious things, which are only abstractions anyway. I answer that you take your method from a science (biology) which deals with what you must condemn as abstractions, namely, individual organisms, which are to any one of us only parts of the total presented world. But, you say, the 'functional' method has always been found useful in dealing with vital and conscious phenomena, and therefore must be presupposed here. Now, in the first place, this is not quite true, for it has not explained the origin of variations, but only their perpetuation. And second, even if it were strictly true, it gives no ground for asserting dogmatically, when we come into what *looks* like a quite different region, that of logic, that the *only possible* method is the functional. This is only a new kind of apriorism, with purpose as its chief category. There may be cases of judgment which the 'functional' view throws no light upon. Of course this view fits the judgments which we make for practical purposes. If, to use Dr. Stuart's illustration, I am chased by a wild beast and see a small tree near me, I need to know whether it will bear my weight before attempting to climb it rather than seek some other escape—and the judgment here is my tentative response to the stimulus of the beast. But do we never judge except to get out of some scrape? Or to put it more fairly, perhaps, do we never judge except to better ourselves? Our writers are careful to choose their illustrations from practical needs. But is all life made up of practical needs? Their own studies in evolution should have taught them that, although the theoretical interest may be far too much neglected to-day, it was not always so. Science and philosophy arose only when the practical needs of men were so well adjusted that a leisure-class could grow up, with time for theoretical interests. The early thinkers did not think because their environment compelled them to think or

die. They thought because they wanted to understand the world. This theoretical interest is lightly dismissed by our school with the words 'but this too is a need.' In the first place this is trivial; it means that we don't try for anything that does not thereby become to us an end. But, second, what is this theoretical need? It is one which is satisfied only by a belief in an external reality which does not alter with the thought of the observer, but which those thoughts represent. If this is a need, it is a need of abolishing pragmatism.

Even in judgments of practical need the theoretical attitude is present. When chased by the wild beast, I am compelled to judge, to make an hypothesis about the strength of the tree. This framing of the hypothesis is a definite state of mind, a single experience. If I test it by climbing the tree, this is also a single experience, distinct from the other. The judgment is thus distinct from the experience to which it refers. The man judging knows that he is referring to a future possibility and has present to his mind the content of his judgment and its reference to something (the future experience) not given, yet something not affected by his judgment about it; rather his judgment is affected (as to error or truth) by the nature of that future experience. That is of course the theoretical attitude, and it is the attitude a man naturally takes; for it is the most useful one. In order to fulfil the practical need one must act for the time as if he were not a pragmatist. Now I shall not dwell on the logical objection that it is just as hard to see how a judgment can refer to a future (or past) experience as to see how it can refer to a reality outside experience. But it certainly looks as if we could not be pragmatists when we are in the thick of the practical struggle. We must be good old-fashioned realists then. Indeed, Professor Dewey admits that we often find it useful to hypostasize some parts or aspects of experience into objective realities. For that matter, the extreme elasticity of 'useful' and 'need' suggests that some logicians may find it more useful to their intellectual needs to reject pragmatism.

The pragmatist can not help talking as if there were a reality whose character does not in the least depend on our judgments. For *either* he must grant that the real is anything that comes along and satisfies my present whim (which of course he would not do), *or* he must appeal to something—the empirical character of human nature, eternal principles, or what not—as containing a standard whereby to judge what whims we should or should not entertain, and can or can not be satisfied. His appeal to the nature of experience, or what not, however, is the theoretic attitude over again—observer and facts observed. He means his words to correspond to facts of experience, and he does not when he is writing out his system of pragmatism mean to have his words remould or alter in anyway those facts. The 'reconstructive' theory will not serve as a refuge here, because it has to meet the following difficulty: If reality is reconstructed by us (we might as well say, in part created, for we mean at least creation of its form) then the part created is dependent on our momentary whim or else on a stable permanent basis in our intellectual nature. The first alternative will of course be

denied: so taking the second, this remoulding must at least not alter those categories which constituted that permanent basis—otherwise the second alternative, which we agreed to take, would be destroyed. In the description of those categories, however much this may remould them, something must remain unaltered, however we describe, define, conceptualize, etc. Now this unaltered part, I take it, we can not very well call unreal—but if so, we have a reality which is not in the least altered by our description and definition of it. And if this must be the case with categories, why may it not hold, too, of the objects given in sense-experience?

Another basis for the system in its idealistic aspect is found in their criticism of the dualistic presuppositions in Lotze's, Bosanquet's, and Bradley's theories of judgment. Now one may perhaps admit that these theories do not offer a quite satisfactory account of the method by which our judgments get a direct hold upon reality itself. It has already been suggested that there is a corresponding dualism in the pragmatic theory of judgment, because actually a judgment refers to some aspect or part of experience not at the moment present to us. I now wish to point out another difficulty, which resides in their description of an idea as a plan of action and of fact as the successful, though perhaps never quite complete, fulfilment of such plan. If an idea is a plan of action, the success of that plan is determined, at least in part, by the nature of the environment. Call the latter one experience if you will—we at least have two distinct regions of experience, the physical and the tentative, hypothetical, the plan of action. The truth of the latter is supposed to mean that they can be carried out, are not inhibited in the process. But the carrying out, or inhibition, is regarded as dependent upon the nature of the environment. The strength of the tree holds me up, or my weight, pressing down upon a branch, breaks it. We simply can not avoid speaking in causal terms here; and that not because we have observed uniform sequences, but because the fulfillment of a plan is regarded as *due to* something other than the plan itself. If there is no necessary connection between them, then the success of the plan might go along with any kind of an environment, and could not be regarded as an unambiguous index of the nature of that environment—in short, it would not be a true description thereof. To say an idea, or rather the judgment containing that idea, is true, means that the environment conditions its fulfillment. If it did not mean this, truth has no necessary reference to fulfillment—but the pragmatist claims that it has. His category of purpose then includes that of cause. Nor can he take refuge in the commonplace evasion that this is only a subjective synthesis—for purpose is meant to have factual validity. I say only that if it does, causation must be treated just as respectfully. Now it happens that Professor Dewey himself treats this category with lofty scorn. (In his paper, 'The Superstition of Necessity,' *Monist,* III., 362). This, however, may be merely accidental. At any rate, the pragmatist has this problem of causation on his hands, and, to judge from the history of philosophy since Hume, it seems to be a more

difficult problem than the one which pragmatism pronounces insoluble (that of the knowledge of external reality)—for the attempts at solution of the former have been less frequent than of the latter.

The spirit of this criticism has been that the empirical method with which pragmatism sets out is indeed the only correct one, but that it has abandoned this method. In actual experience, even when engaged in the 'struggle for existence' we regard and seek other things than our own advantage. We do discover truth by analysis of the present as well as by the study of origins in the past. We find that we are compelled to use certain standard categories—*e. g.*, permanent reality, causation—and even the pragmatist has his *a priori* category of purpose. Pragmatism in neglecting the analytic study of these categories is narrow and unphilosophical. On the other hand, one must admit that it is a very essential guide of method. In seeking to know the real world, we best advance by noticing the most fruitful hypotheses, those which embrace the most facts. But this is only a matter of subjective method, for the wider collection of facts is no more real than the narrower.

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The Standpoint of Experience. J. E. CREIGHTON. *Philosophical Review,* November, 1903, pp. 593–610.

While we all claim to be empiricists as basing our philosophies upon 'experience,' this term, 'far from being a clear and transparent medium that presents to us facts in unambiguous and unmistakable form, is rather so many-sided and complex, in some relations so shifting and unstable, as to be capable of yielding various and even contradictory readings.' Different points of view result in different selections of facts and thus give an *a priori* bias to every philosophy. I. 'Definition and determination of the true standpoint of experience is, in a certain sense, the essential . . . problem of philosophy.' The test of the adequacy of any experience must be intelligibility, *i. e.*, 'completeness and consistency both of facts and relations.' This implies apprehension of experience through intelligence; precludes the possibility of a 'pure' or presuppositionless experience—an experience *ab extra;* and requires that in every stage experience contain 'the moving principle of thought as its dynamic and integrating factor.' What, then, is the standpoint of experience for the philosophy of our time? Obviously, not that of the plain man, but that reached through the development of philosophical thought. Hence, the important question is: 'What may fairly be said to have been established through the reflection of the past and the discussions of our own day?' II. In answer, the author gives three propositions: (1) 'Experience is not a stream of subjective processes, existing as mental modifications in a thing called mind.' Experience shows no such disjunction of subject and object, body and mind, as this would imply; it is 'not the resultant of a mechanical interplay of two independent things, but the concrete expression of rational life, having subject and object as organic, though distinguishable members of its essen-

tial unity.' (2) 'The relation of subject and object in experience can not be adequately expressed in terms of cause and effect.' Parallelism, *e. g.*, shows that 'the relation of body and mind is no external and occasional relation of two separate entities, but is so close and intimate . . . that it can not be adequately described by the mechanical notion of action and interaction.' (3) 'The mind is not one particular thing separated from other things, but as a true individual it contains within itself the principle of universality.' This is 'shown by the fact that it is able in one indivisible act [reason] to differentiate itself from things and to relate them to the unity of its own life.' III. The standpoint of special sciences views experience as a collection of things to be observed and operated upon externally. Philosophy deals with experience from an internal point of view, as we actually live it; and this, indeed, is what makes philosophy preeminently the science of experience. IV. The philosopher's business is, on this view, to interpret experience, give appraisements of our various ideals—rational, ethical, esthetic—and discover the categories that will preserve truth and harmonize the ideals. Necessarily the process is teleological, with the world regarded as an instrument for the realization of ends. This is not subjectivism—the 'hard discipline of the real world' prevents that—but at the same time it subordinates the real to the ideal, the whole significance of facts in experience being due to conscious selection of them. The necessity for the subordination of the real to the ideal springs from the fact that subject and object as functions are not coordinate. Functions 'imply a central unity which is something more than the mere togetherness of parts. . . . The fact of functional relationship implies the existence of an inner pervading identity running through the parts. In experience this principle of identity comes to consciousness of itself by distinguishing itself from the objects in which its nature is expressed and embodied. And in this act of discrimination and recognition there is to be found the central principle in the light of which the whole process of experience gains significance and the possibility of interpretation.' Hence, 'to give a philosophical interpretation of experience is to show its relation to the ideals and purposes of a rational self-consciousness.'

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Les éléments et l'évolution de la moralité. M. MAUXION. *Revue Philosophique,* July and August, 1903, pp. 1–29 and 150–180.

Professor Mauxion finds the present time peculiarly without a well-based morality. Approving the reduction of morality to a factual basis, he sees danger in identifying morality with sociality and in finding the basis of individual morality in social morality. It is a gratuitous hypothesis, he says, to regard society as an actual organism, because individuals are not fixed like cells and, moreover, have an independent value. The social organism theory would necessitate the recognition of groups or castes as in India and also does violence to the classification of sciences, reducing sociology to biology. Social and moral progress differ as much as scientific and esthetic.

The study of morality, however, must not go to the other extreme of the individual, *a priori,* building up what is right without regard to circumstances. Hence we will regard it from the evolutionary (genetic) standpoint.

But how speak of progress without some conception of a good to start with? He answers that the conception of the good is composed of two factors, intelligence and sensibility. Progress in the former consists in more perfectly conforming thought to reality, and in the latter, is a grasping of the harmony of things by the heart instead of the reasoning. Hence progress in morality is an increasing sympathy with the rhythms of the universe.

A more careful analysis of the idea of the good gives three elements: (1) esthetic order, the self-directed duties especially, or the individual perfection; (2) logical order, including proportion; (3) sympathetic or altruistic order, whether active or passive.

These three elements, though instinctively blended, are distinct. They vary independently in respect to periods and races, and excite different emotions in us when we contemplate them.

Having found the elements, we now proceed to trace their evolution.

1. *Esthetic Order.*—Among men admiration of stature and strength came first, then courage, prudence, patience, strength of soul, wisdom, stoic indifference, asceticism, good-will. The goal will be to harmonize all these ideals.

2. *Evolution of the Element of Logical Order.*—This element, though imposing itself with incomparable force, is nevertheless dominated as to its development by the preceding element. Primitive man was not better than the modern man, as though the eighteenth century, nor was he absolutely ferocious, as said Hobbes. Within the tribe there would generally be peace. A few because of greater strength would obtain more prey and booty, and as this *proportionality* of means and influence became a *custom* the idea of justice would be founded. What had been would be regarded as what ought to be. This idea of justice would receive further definition when the rewards of an expedition would be divided proportionately. Here would come in the esthetic element, the particular form of proportion being determined by the stage of evolution which the esthetic element had reached. Virtue then determined rewards. A future life was postulated by some when facts seemed to do too great violence to the idea of justice. Others, like the Stoics, found the proportionality not destroyed by circumstances, provided man retained his ego.

The idea of justice appears in time to have a different basis from that of proportionality and men speak of a person's right to his life, his liberty, property, etc. Some would give utility as a basis for this, and others fellow-feeling. But originally there was no regard for man as an individual, quite the contrary. How, then, has it come about that proportionality was transformed into equality? Many causes—the endeavor of the highest to make all below equal; the natural tendency of the higher classes to degenerate; above all, the change in the esthetic

element and the corresponding increase in the sympathetic element. Such esthetic ideals as patience, wisdom, stoicism, asceticism and good-will were strong factors in changing proportionality into equality. Equality, however, does not give an idea of justice according to facts, so that our ideal must be a more exact proportionalism.

3. *Evolution of the Sympathetic Element.*—This element is rather independent of the two preceding, but influences them. The love of animals for persons and places shows that sympathy can not be, as Schopenhauer thought, reduced to physiological love. The basis of sympathy is in the spontaneous tendency of similar organisms to enter into harmony; that is to say, in the instinct of imitation. Similarity begets attachment, and *vice versa.* Passive love progresses with the physiological and mental development. Not so is it with active love.

The first stages of sympathy come when men wandering together in groups experience the same dangers and hopes. This instinctive element is fortified by reflection and common interests, and still more when the domiciles are fixed, giving patriotism. The patriarchal family developed out of promiscuity, when one man would be strong enough to retain his own wife or wives as he did his arms. The family associations were very strong factors in developing the sense of sympathy and solidarity. Out of it grew pity, then benevolence and charity.

Professor Mauxion thinks that this account of the genesis of morality makes unnecessary the chimeras of an absolute good or of a categorical imperative or of inherent personal rights, and avoids much of the mystery and confusion with which the subject of ethics is filled; the idea of solidarity and harmony will supplant that of interest.

By way of comment on Professor Mauxion's article we may venture to say that all will welcome the treatment of ethics from the genetic standpoint. If it be objected that the sense of harmony which he gives as the basis for the evolution of morality in the present particular direction is too weak an ethical motive, it may be answered that he makes out a strong case for custom as giving force to this motive.

That in his primary analysis he is obliged to distinguish between grasping the harmony with the mind and grasping it with the heart, is not so much his fault as it is the fault of psychology, which has not yet seriously grappled with the place and the origin of the value element in experience.

GEO. R. MONTGOMERY.

JOURNALS AND NEW BOOKS

THE MONIST. January, 1904. Vol. XIV., No. 2. *Primitive Rome (pp. 161–176):* G. SERGI.–'The problem . . . is to determine who were the founders of Rome.' The author concludes that 'Rome was founded under the influence of the Mediterranean civilization and especially of the Etruscan . . . and of ethnic elements already mingled. . . . The Aryans gave only the language.' *Ants and some other Insects (concluded, pp. 177–193):* AUGUST FOREL.–On the basis of evidence ad-

duced in this and previous articles the author concludes that 'The senses of insects are our own. Only the auditory sense still remains doubtful so far as its location and interpretation are concerned. A sixth sense has not yet been shown to exist, and a special sense of direction and orientation is certainly lacking.' 'In social insects it is possible to demonstrate the existence of memory, associations of sensory images, perception, attention, habit and simple forms of inference and adaptation.' The numerous odor qualities can constitute a spatial order, and 'In combination with the powerful development of the cerebrum, the topochemical olfactory sense of the antennæ constitutes the key to ant psychology.' *The Still Small Voice (pp. 194–206):* EDITOR. – Dr. Carus argues that the higher criticism and the physical sciences are preparing the way for a nobler and truer form of religious faith, and that only the sensually minded can permanently regret the substitution of an abstract eternal principle for a personal God. *A Buddhist Genesis (pp. 207–214):* ALBERT J. EDMUNDS. – This mythical account of the Fall dates from the fifth to the first century B. C., and is here translated for the first time from the original text. It is very quaint and beautiful and describes the various steps in the degeneration of man with the corresponding steps in the evolution of the world, the process culminating in the invention of human institutions. *The Higher Criticism (pp. 215–252):* GEO W. GILMORE. – In the hope of removing the prejudice against the higher criticism, which is prevalent even to-day, the writer points out the injustice and absurdity of regarding the movement as irreverent in spirit or in results, or as animated by a special hostility to the Bible. *The First Buddhist Council (pp. 253–282):* TEITARO SUZUKI. – The writer has collected materials from Chinese sources on which he bases an account of the doings of the First Convocation, the various incidents connected with it, and the attitude assumed towards it by different schools of Buddhism. *Literary Correspondence, France (pp. 283–293):* LUCIEN ARRÉAT. – A critical résumé of recent French contributions to philosophy and psychology. Criticisms and Discussions. *Physics and Metaphysics (pp. 294–300):* PAUL R. SHIPMAN. – The writer agrees with Sir Oliver Lodge's assertion that life directs energy, but opposes the inference that it is therefore immaterial. Book Reviews. Notes.

PSYCHOLOGICAL REVIEW. Article section. January, 1904. Vol. XI., No. 1. *The Participation of the Eye Movements in the Visual Perception of Motion (pp. 1–14):* RAYMOND DODGE. – Experimental examination of the different types of eye-movement shows that kinesthetic sensations, arising therefrom, can not form the basis for the visual perception of motion. An object projected throughout on the same point of the retina does not appear to move when the eye moves. Even when the eye is following a moving object, that object does not seem to move if its image is really stationary on the retina. For the most part, these movements of pursuit are not accurate enough to prevent some motion of the image on the retina; the appearance of movement, here and always, depends on the motion of the image on the retina. *An Inquiry into the*

Nature of Hallucinations, I. (*pp. 15–29*): BORIS SIDIS. – Normal perception, illusion and hallucination are currently distinguished by reference to their objective validity. The author attempts a distinction in purely psychological terms, based upon an interesting reexamination of the process of perception, which is found to be independent of memorial representation. In normal perception, the 'sensory nucleus,' resulting directly from the external stimulus, is immediately enveloped by 'secondary sensations'; in illusion, the nucleus is enveloped by secondary sensations not properly belonging to it; and in hallucination the sensory nucleus is overwhelmed by secondary sensations, so that the perceptual compound is no longer centered about the sensation proper. For instance, a visual hallucination may be aroused by an auditory sensation. Hallucinations, as well as illusions, are of peripheral origin. *The Limits of Pragmatism* (*pp. 30–60*): J. MARK BALDWIN. – The pragmatic method, useful in genetic psychology, and valid up to the point of transition to logic or metaphysics, leads, if adopted as a universal philosophy, to inconsistency in the treatment of such problems as the environment, universal truths, fact and 'meaning.' It commits the 'genetic fallacy,' by fixing on one term of a dualism as the only reality, whereas both terms have developed only in relation to each other. 'No member of a genetic dualism or other contrast should be taken as the explaining principle of the process on which the dualism or contrast rests'; the only solution of a dualism is 'an experience in which the dualism is actually outlived.' *Discussions: The Sexual Element in Sensibility* (*pp. 61–67*): W. I. THOMAS. – The sensitiveness of an individual to the way in which others regard him can not have arisen from the instincts connected with food-getting and competition, but must come from the sexual instinct. *Dr. Morton Prince and Panpsychism* (*pp. 67–69*): C. A. STRONG. – A recognition of Dr. Prince's contributions to the development of this view.

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NOTES AND NEWS

Dr. David Duncan, having been entrusted by the late Mr. Herbert Spencer with the writing of his biography, will be obliged to persons who may possess letters from him of interest if they will lend them for the purpose of such biography. All letters addressed to Dr. Duncan, care of H. R. Tedder, Esq., Secretary, The Athenaeum, Pall-mall, London, S. W., will be carefully preserved and returned in due course to their owners.

The University of Cambridge has issued, as a guide to students, a pamphlet on 'Advanced Study and Research' in the university. The pamphlet exhibits the conditions of admission of advanced students, the regulations governing their studies, and a list of courses offered. Under the head of 'Moral, Mental and Political Sciences' the following philosophical courses are noted: Professor W. R. Sorley, Ethics; Professor J. Ward, Metaphysics, Psychology; Dr. J. N. Keynes, Formal and Inductive Logic; Mr. W. E. Johnson, Psychology, Logic; Mr. W. H. R. Rivers, Experimental Psychology; Mr. T. W. Levin, Logic, Metaphysics; Dr. J. M. E. McTaggart, History of Philosophy; Mr. G. E. Moore, Modern Moral Philosophy.

Professor Eduard Zeller, the distinguished scholar and philosopher, and the author of 'The Philosophy of the Greeks,' and of 'The History of German Philosophy since Leibnitz,' celebrated his 90th birthday on January 22. As we learn from the London *Times* the Emperor William presented him with a signed portrait acompanied by the following autograph letter:—

"My dear Professor Zeller,—On this day, on which you can look back upon 90 years of a life of activity crowned with success, I associate myself in spirit with the representatives and disciples of German learning in offering you my sincere congratulations and good wishes on the completion of this significant age of your life's journey. My thoughts

and wishes, however, are addressed not only to the great philosopher of whom German learning will be proud for all time, but also to one who stood in such close relations to my late parents. It affords me heartfelt pleasure that I have been able to bequeath to posterity your bust carved by a master hand and erected upon an historic site in the capital of the Empire beside the statues of my lamented parents. My one regret has been that you yourself were unable to be present at the imposing ceremony of the unveiling. Please accept the enclosed portrait in memory of to-day, and when you look at it remember that to hear of your wellbeing will at all times continue to give particular pleasure to your grateful King.—WILLIAM I. R."

PROFESSOR EMIL KRAEPELIN, of Munich, well known for his applications of exact psychological methods in psychiatry, will spend some time in the Dutch East Indies studying insanity among the natives.

A CONGRESS for Experimental Psychology will be held at Giessen on April 18, 19 and 20. In addition to papers and demonstrations, there will be an exhibition of psychological apparatus.

THE Society for Psychical Research held its annual meeting in London on January 29, when Sir Oliver Lodge resigned the presidency to Professor F. W. Barrett, who made an inaugural address. It was announced that the society has 832 members, while the American branch has 530 members. The sum of $30,000 had been collected to endow a research scholarship.

DR. TOULOUSE, chief physician of the asylum of Villejuif and director of the Laboratory of Experimental Psychology at the Paris Ecole des Hautes Etudes, has become editor of the *Revue scientifique,* which for forty years has been the leading French weekly scientific journal.

PROFESSOR JOSIAH ROYCE completed on February 15, a course of five lectures on the 'Comparative Study of Scientific Concepts,' at Columbia University.

AT the College of the City of New York, Profesor Ludwig Friedburg, of the Department of Chemistry, is delivering a course of lectures to graduate students and visitors, on questions connected with the theories of chemistry and the philosophy of science.

MR. WILLIAM HARPER DAVIS, fellow in psychology in Columbia University, has been appointed instructor in philosophy in Lehigh University.